



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/526,957 03/16/00 SEBESTA

R EN9-98-141

005409
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MM91/0119

EXAMINER	
MITCHELL, J <i>vin</i>	
ART UNIT	PAPER NUMBER

2822

DATE MAILED: 01/19/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/526,957

Applicant(s)

SEBESTA ET AL.

Examiner

James Mitchell

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 16 March 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

1. This office is in response to the preliminary amendment filed March 16,2000.

Drawings

2. The drawings are objected to because character 93 of Figure 9 does not show a pad as indicated in the specification. Correction is required. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect can be deferred until the application is allowed by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4,6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Furukawa (JP 10032371).
5. Furukawa discloses (Fig. 24) substrate (13), first conductive pad with first thickness (23), second conductive pad with second thickness (25); first and second circuit line in contact; third line coupled to substrate; first and second lines mechanically coupled substrate; plated through hole (19).

Claim Rejections - 35 USC § 103

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

7. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 5 rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa as applied to claims 1-4,6-8 and further in view of Frey et al. (U.S. 5,249,101).

9. Frey utilizes a protective coating (Lines 49-54, Column 3). It would have been obvious to combine Furukawa's circuit patterns with Frey's protective coating in order to protect the circuitry from mechanical and environmental hazards.

10. Claims 9,10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa as applied to claims 1-4,6-8 and further in view of Nishiguchi et al. (U.S. 5,214,308).

11. Furukawa does not show first and second solder balls with unequal diameters, but Nishiguchi utilizes first and second solder with unequal diameters (Figure 7).

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12. It would have been obvious to reduce or enlarge the diameter of solder balls in order to form strong mechanical and electrical connections with smaller or larger contacts without damage to the device.

13. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa as applied to claims 1-4,6-8 and further in view of Haji (U.S 5,767,008) and Bertin et al. (U.S 5,977,640).

14. Furukawa does not disclose metal layers, wire bond interconnect or solder ball coupled to Electronic carrier, however Haji utilizes contact pad comprising copper, nickel barrier layer, and gold top layer (Lines 34-5, Column 5-6), but does not disclose a wire bond with solder ball interconnect.

15. Bertin utilizes wire bond interconnect to pad (Fig. 5) and electronic carrier coupled to solder ball.

16. Although a solder ball connected to pad is not shown, it would have been obvious to one of ordinary skill in the art to use a pad with solder balls since it is a conventional method for forming a mechanical and electrical connection with substrate.

17. Further, it would have been obvious to one of ordinary skill in the art to combine Furukawa's pad with Haji's metal layer pad and Bertin's wire and solder ball interconnect for increased device density and electrical contact.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Waters et al. (U.S 3,518,751), Cutting et al. (U.S 5,638,597), Laine et al. (U.S 5,616,958).

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The cited art discloses: ref. 1 protective coat for circuitry, ref. 2 solder ball with wire bond interconnect, ref. 3 Large and small pads for different size solder balls.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Mitchell whose telephone number is (703) 305-0244. The examiner can normally be reached on M-F 10:30-8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead II can be reached on (703) 308-4083. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3230 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

jmm
January 11, 2001


CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

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